

Claims

1. A chromatin insulator consisting of SEQ ID No. 1.
2. A vector comprising one or more insulators according to claim 1.
- 5 3. A vector according to claim 2, further comprising a DNA element selected from:
 - a. an enhancer, or a functional expression enhancing fragment thereof;
 - b. a promoter domain or a functional expression promoting fragment thereof;
 - c. a DNA sequence coding for one or more polypeptides of interest.
- 10 4. The vector according to claim 2 or 3, further comprising one or more DNA sequences coding for regulatory elements selected from 5'UTRs, introns, 3'UTRs, mRNA 3' end processing sequences, polyadenylation sites, and internal ribosome entry sequences (IRES).
5. The vector according to claim 3 or 4, wherein the DNA sequence is coding for
15 more than one polypeptide of interest through a polycistronic mRNA.
6. The vector according to any of claims 2 to 5, further comprising one or more DNA elements selected from boundary elements, locus control regions (LCRs), matrix attachment regions (MARs), and elements for recombination and cassette exchange.
- 20 7. The vector according to any of claims 2 to 6, wherein the promoter is selected from cellular or viral/phage promoters such as mCMV-IE1, mCMV-IE2, hCMV, SV40, RSV, T7, T3, or a functional expression promoting fragment thereof.
8. The vector according to any of claims 2 to 7, wherein the polypeptide of interest is selected from FSH, LH, CG, TSH, growth hormone, interferon, TNF binding
25 protein I, TNF binding protein II, IL-18BP, IL-6, IFNAR1, LIF or muteins, fragments, functional derivatives, fusion proteins thereof.
9. The vector according to any of claims 2 to 8, wherein the polypeptide of interest is selected from EPO, G-CSF, GM-CSF, a chain of a humanized antibody, a cytokine, a coagulation factor, etanercept, tPA, an integrin or muteins, fragments,
30 functional derivatives, fusion proteins thereof.
10. The vector according to any of claims 2 to 9, wherein the polypeptide of interest is selected from adenosine deaminase (ADA), aminoglycoside phosphotransferase

- (neo), dihydrofolate reductase (DHFR), hygromycin-B-phosphotransferase (HPH), thymidine kinase (tk), xanthine-guanine phosphoribosyltransferase (gpt), multiple drug resistance gene (MDR), ornithine decarboxylase (ODC) and N-(phosphonacetyl)-L-aspartate resistance (CAD), puromycin acetyltransferase (PAC), galactokinase, human folate receptor, or reduced folate carriers.
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11. The vector according to any of claims, 2 to 10 wherein the polypeptide of interest is selected from luciferase, green fluorescent protein, alkaline phosphatase, and horseradish peroxidase or combinations thereof.
12. The vector according to any of claims 2 to 11, wherein one insulator is positioned upstream and one insulator is positioned downstream of the DNA sequence coding for a polypeptide of interest.
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13. The vector according to any of claims 2 or 11, wherein at least two insulators are positioned upstream and downstream of a DNA sequence coding for a polypeptide of interest, respectively.
14. The vector according to any of claims 12 or 13, wherein at least two coding sequences are positioned between the insulators.
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15. The vector according to claim 14, wherein the at least two coding sequences code for subunits of a multimeric protein.
16. The vector according to claim 15, wherein the first subunit is the alpha chain and the second subunit is the beta chain of a hormone selected from human FSH, human LH, human TSH and human CG.
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17. The vector according to claim 15, wherein the first subunit is the beta chain and the second subunit is the alpha chain of a hormone selected from human FSH, human LH, human TSH and human CG.
18. The vector according to claim 15, wherein the first subunit is the heavy chain and the second subunit is the light chain of an immunoglobulin.
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19. The vector according to claim 15, wherein the first subunit is the light chain and the second subunit is the heavy chain of an immunoglobulin.
20. A host cell comprising an insulator according to claim 1.
21. A host cell transfected with a vector according to any of claims 2 to 19.
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22. A host cell according to claim 20 or 21, wherein the host cell and the insulator are derived from different species.

23. The host cell according to any of claims 20 to 22, wherein the host cell is a CHO cell.
24. A process for the production of a polypeptide of interest comprising the step of transfecting a host cell with at least one vector according to any one of claims 2
5 to 19.
25. A process for the production of a polypeptide of interest comprising the step of culturing a host cell according to any of claims claim 20 to 23
26. The process according to claim 24 or 25, further comprising the step of isolating the polypeptide of interest from the host cells.
- 10 27. The process according to any of claims 24 to 26, wherein the transfection is stable transfection.
28. The use of a vector according to any of claims 2 to 19 for expression of a gene of interest.
29. The use of a vector according to any of claims 4 to 19 for simultaneous
15 expression of two or more genes or DNAs of interest
30. The use of a vector according to any of claims 2 to 19 for the manufacture of a medicament for DNA-based therapy.